

What is Claimed is:

1. A flow rate measuring apparatus comprising:
an ultrasonic transmission section for transmitting an
ultrasonic wave to fluid flowing in a flow passage;
5 an ultrasonic receiving section for receiving an
ultrasonic wave which has propagated through the fluid;
a transmission timing control section constructed so as
to permit said ultrasonic transmission section to transmit an
ultrasonic wave in accordance with a plurality of transmission
10 modes different in transmission timing from each other; and
a flow rate operation section for calculating a flow rate
of the fluid on the basis of an output signal of said ultrasonic
receiving section.

2. A flow rate measuring apparatus as defined in claim
15 1, further comprising a transmission mode selection section for
carrying out change-over among said transmission modes based on a
result of the calculation by said flow rate operation section.

3. A flow rate measuring apparatus as defined in claim
1, wherein said transmission modes include:

20 a first transmission mode which permits an ultrasonic
wave to be transmitted at a predetermined timing for every period
of a flow waveform of the fluid; and

a second transmission mode which permits an ultrasonic
wave to be transmitted at a timing shifted by a predetermined
25 time for every period of the flow waveform of the fluid.

4. A flow rate measuring apparatus as defined in claim
2, wherein said transmission modes include:

a first transmission mode which permits an ultrasonic
wave to be transmitted at a predetermined timing for every period
30 of a flow waveform of the fluid; and

a second transmission mode which permits an ultrasonic
wave to be transmitted at a timing shifted by a predetermined
time for every period of the flow waveform of the fluid.

5. A flow rate measuring apparatus as defined in claim

3, wherein said transmission modes further include a third transmission mode which permits an ultrasonic wave to be transmitted at predetermined intervals.

6. A flow rate measuring apparatus as defined in claim 4, wherein said transmission modes further include a third transmission mode which permits an ultrasonic wave to be transmitted at predetermined intervals.

7. A flow rate measuring apparatus as defined in claim 4, further comprising a transmission timing setting section for resetting a transmission timing of said first transmission mode in accordance with a result of the calculation by said flow rate operation section;

said transmission mode selection section carrying out change-over from said second transmission mode to said first transmission mode thus reset.

8. A flow rate measuring apparatus as defined in claim 6, further comprising a transmission timing setting section for resetting a transmission timing of said first transmission mode in accordance with a result of the calculation by said flow rate operation section;

said transmission mode selection section carrying out change-over from said second transmission mode to said first transmission mode thus reset.

9. A flow rate measuring apparatus as defined in claim 6, further comprising a flow rate variation judging section for judging whether or not a variation in flow rate is reduced based on a result of the calculation by said flow rate operation section;

said transmission mode selection section carrying out change-over from said first or second transmission mode to said third transmission mode when a variation in flow rate is reduced.

10. A flow rate measuring apparatus as defined in claim 8, further comprising a flow rate variation judging section for judging whether or not a variation in flow rate is reduced based

on a result of the calculation by said flow rate operation section;

- 5 said transmission mode selection section carrying out change-over from said first or second transmission mode to said third transmission mode when a variation in flow rate is reduced.

add

09768857 042404